Emissions Inventory Help Sheet for Printing Plants (Offset or Lithography)

What do I need to report?

A printing facility emits pollutants from the printing ink, fountain solution and cleaning solvents, including blanket wash. Printers report these emissions on the **Evaporative Process Form.** See the "Instructions for Reporting 2002 Annual Air Pollution Emissions" for more information about reporting emissions.

How do I fill out the Evaporative Process Form?

- Line 1, "Process Type/Description" should include basic information such as "Offset Lithography" (Tier Code 080203).
  These instructions do not apply to "Flexography" or "Letterpress" (Tier Code 080202) or "Gravure" (Tier Code 080204).
- If Process IDs are not printed on your forms, provide a unique Process ID number for each material on the form.
- Examples of "Material Type" would be "heatset ink," "ink (cold)," "fountain solution," "blanket wash," etc.

IMPORTANT: Because of the unusual calculations for lithographic ink due to paper retaining the solvent in the ink, the annual ink usage must not include the amount of ink in the waste disposed. Subtract the ink in your waste sent off-site from the total year's ink purchases, and provide this amount as your annual usage (column 10). Do NOT include ink on any Off Site Recycling/Disposal Forms. If you have any questions, call (602) 506-6790.

How do I determine the emission factors (EF) for my materials?

The best source for this information is your MSDS. The EF can be expressed as a percentage (fraction) of pollutant by weight (lb/lb) or as pounds of pollutant per gallon (lb/gal). Except for ink, the EF is the pollutant content. The pollutant in the ink retained by the paper is considered when determining the EF for ink.

- For cold presses, only 5% of the VOC from the ink is emitted as a pollutant, with 95% retained in the paper.
- For heatset presses, 80% of the VOC from the ink is released as a pollutant, with 20% retained in the paper.

Examples: A cold press ink with 20% VOC has an EF of (0.20 × 0.05) = 0.01 pounds of VOC per pound of ink used.
A heatset ink with 30% VOC has an EF of (0.30 × 0.80) = 0.24 pounds of VOC per pound of ink used.

Capture and Control for Heatset Facilities

Heatset facilities use emission control devices, such as a thermal oxidizer. The oxidizer captures and destroys pollutant emissions from ink, fountain solution and sometimes blanket wash. The assumptions below are the total capture and control efficiencies. **Attach documentation for your emission factor calculations, stating how the control efficiency was determined (and test date, if applicable).**

- For heatset inks, report capture efficiency as 100%. Report the control efficiency of an oxidizer as determined from the most recent approved performance test.
- For fountain solutions, up to 70% of the pollutant is captured and controlled (maximum capture × control = 70%).
- For automatic blanket washes with a vapor pressure of less than 10 mm Hg at 20°C, you may assume 40% of the pollutant is captured and controlled (maximum capture × control = 40%). You may not take credit for pollutant reduction by your oxidizer if you use a blanket wash with a higher vapor pressure or one that is not automatic.

Example: An offset printer used 11,575 lbs of heatset ink. Waste disposal records indicate 575 lbs of ink were disposed. The ink EF is 0.24 lb VOCs/lb ink. A catalytic oxidizer was used with a destruction efficiency of 96%.

Annual usage (column 10): 11,575 lbs – 575 lbs = 11,000 lbs ink
Calculation (before control): 11,000 lbs ink × 0.24 lbs VOC released/lb of ink = 2,640 lbs VOC released

Control (catalytic oxidizer): 100% capture (reported in column 14), 96% control (reported in column 15)
Emissions (column 16): 2,640 lbs VOC × [1 – (100% × 96%)] = 106 lbs VOC emitted
(This example is shown as Process ID 1 on the sample Evaporative Process Form on the reverse.)

Reference: U.S. Environmental Protection Agency, 1994. *Alternative Control Techniques Document: Offset Lithographic Printing.* Office of Air Quality Planning and Standards, EPA-453/R-94-054. Research Triangle Park, North Carolina.

Emissions Inventory EXAMPLE: Lithographic Printing Plants

Evaporative Process Form

Permit number(s) ***99XXXX***

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1- Process Type/Description: ***Offset Lithographic Printing***

2- Process TIER Code: ***080203***

3- Seasonal Throughput Percent: Dec- Feb ***25*** % Mar- May ***25*** % Jun- Aug ***25*** % Sep-Nov ***25*** %

4- Normal Operating Schedule: Hours/Day ***9*** Days/Week ***5*** Hours/Year ***2340***

5- Typical Hours of Operation *(military time)* Start ***0800*** End ***1700***

6- For STORAGE TANKS Only. Select only one: ☐ Above Ground Vaulted ☐ Under Ground ☐ Above Ground NON-Vaulted

7	8	9	10		11	12		13	14	15			16
Process ID	Stack ID(s)	Material Type	Annual Usage Input	lb or gal	VOC, HAP&NON or NHx	Emission Factor	EF Units (lbs per)	Pounds of pollutant* sent off site	Capture % Efficiency	Control ID	Control % Efficiency	Control % Efficiency	Estimated Emissions (lbs/yr)
1	*1*	*Heatset inks*	*11,000*	*lb*	*VOC*	*0.24*	*lb*		*100* %	*1*	*96* %	*1*	*106*
2	*1*	*Heatset fountain solution*	*1,500*	*gl*	*VOC*	*6.7*	*gal*		*73* %	*1*	*96* %	*1*	*3,007*
3		*Inks (cold)*	*5,800*	*lb*	*VOC*	*0.015*	*lb*		%		%		*87*
4		*Fountain solution*	*800*	*gl*	*VOC*	*6.7*	*gal*		%		%		*5,360*
5		*Blanket wash*	*1,550*	*gl*	*VOC*	*6.5*	*gal*	*1,100*	%		%		*8,975*

Notes:

- ***If columns 14 & 15 are filled in, a Control Device Form must also be submitted.***
- ***Maximum allowed capture-and-control efficiency for heatset fountain solution is 70%. Therefore, calculate capture efficiency for Process ID #2 as follows:*** **70% (fountain solution maximum capture × control) ÷ 0.96 = 73%**
- ***Process ID #2 is calculated as:*** **1500 × 6.7 × [1 – (0.73 × 0.96)] = 3007 lbs/yr.**
- ***Claiming credit for off-site recycling/disposal of any materials other than ink is optional, but if you do so, you must also complete an Off-Site Recycling/Disposal Form (see example in Instructions for Reporting 2002 Annual Air Pollution Emissions). For ink, subtract pounds of ink waste before reporting the annual usage in column 10.***

Note: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-site Recycling/Disposal Form to receive credit for reduced emissions.

**** Control Efficiency Reference Codes**

1 = Tested efficiency / EPA reference method **2** = Tested efficiency / other source test method **3** = Design value from manufacturer

4 = Best guess / engineering estimate

5 = Calculated based on material balance

6 = Estimated, based on a published value.